

REMARKS

Reconsideration and allowance of this application are respectfully requested in view of the amendments above and the remarks below.

Conditional Allowance of Claims 30 and 31

Initially, applicant gratefully acknowledges the conditional allowance of claims 30 and 31 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form, including all of the limitations of the base claim, and any intervening claims.

By this amendment, new claims 32 and 33 have been added. New independent claim 32 is based on the subject matter of claims 17, 29, and conditionally allowed claim 30. New claim 33 is dependent on new claim 32.

It is believed that new claims 32 and 33 are now in condition for allowance. No limitation on the scope of these claims should be inferred from the arguments below since these claims have already been indicated as having allowable subject matter.

Election/Restriction

In the Office Action, claims 20, 23, and 25 were again indicated as being withdrawn from consideration allegedly due to being drawn to a non-elected species. By this amendment claims 20, 23, and 25 have been canceled without prejudice, in an effort to overcome this objection, and expedite and place the application in condition for allowance.

35 U.S.C. §112 Rejections

In the Office Action, claims 26-28 were rejected under 35 U.S.C. §112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the Office Action, it was noted that the preamble of claim 26 discloses a valve but the body of the claim discloses a container assembly comprising a cap, inlet means, riser tube and restricted bores, none of which are actually parts of the valve, therefore allegedly the valve does not appear to further limit the claim from which it depends.

By this amendment, claim 26 has been amended and placed in independent form as reciting an assembly comprising a valve and a container assembly. The valve is defined by reciting all the limitations of the valve found in amended independent claim 17 as noted below. The phrase "a container assembly adapted to contact a supply" has been corrected to recite "a container assembly adapted to contain a supply". Support is found in paragraph [0051] of the specification. Dependent claims 27 and 28 also been amended to refer to the assembly of claim 26. It is respectfully submitted that the introduction of new matter has been carefully avoided and the amendments to these claims do not raise any new issues.

In the Office Action, claim 29 was rejected under 35 U.S.C. §112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Office action noted that it is allegedly unclear whether claim 29 is intended to be dependent on claim 17 or intended to be an independent claim.

By this amendment, claim 29 has been amended by incorporating the subject matter of amended claim 17 as noted below and placed in independent form. It is respectfully submitted that the introduction of new matter has been carefully avoided and the amendments to this claim do not raise any new issues.

It is respectfully requested that these §112 rejections have now been overcome.

35 U.S.C. §103(a) Rejections

In the Office Action, claims 17-19, 21, 24 and 29 were rejected under U.S.C. §103(a) as being allegedly unpatentable over Hehr et al. (U.S. Patent No. 3,704,553) in view of Goodwin et al. (U.S. Patent No. 3,419,220) and Keizers (U.S. Patent No. 5,283,991). Applicant respectfully traverses this rejection for the following reasons.

Briefly summarized, one aspect of applicant's invention is directed to a valve for the control of a flow of abrasive particles suspended in a pressurized carrier fluid such as an aqueous carrier liquid for cutting materials such as metals, ceramics, polymers and composite materials. In one embodiment, as shown in FIG. 4 with the valve open, fluid enters through an inlet connection 80, and passes through a tube 78, and a pair of valve seats 75 and 74, to an outlet connection 81. Apertures are provided in each valve seat 74 and 75 which are aligned in an open position of the valve, allowing fluid to pass therethrough. To shut off the fluid flow, a first valve seat 75 is slid over a second valve seat 74 to a position in which the aperture through the first seat 75 is sealed off by a face of the second seat 74. A spring 77, acting on a carrier 76 for the first seat 75, loads the seats 74 and 75 together.

When the fluid in the inlet connection 80 is pressurized, the major load on the seats 74 and 75 can be due to fluid pressure acting on the upper end of the tube 78. Other embodiments of the tube are shown in FIG. 7 (reference number 86) and in FIGS. 8, 9 and 10 (reference number 91).

By this amendment, independent claim 17 has been amended to incorporate the subject matter of dependent claim 18. In particular, independent claim 17 has been amended to further recite the valve as having "an elongate tubular strut means bearing at a first end thereof on a first of said valve seat means", "said valve

seat means being urged sealingly together by the pressure of the carrier liquid exerted on a second end of the strut means remote from the first and transmitted generally longitudinally of the strut means to said first valve seat means", and "the flow of abrasive particles and carrier liquid being passed to the valve seat means through said tubular strut means." Support for the amendment to claim 17 is found in dependent claim 18 and paragraph [0040] of the specification, together with FIG. 4 and the associated text in paragraph [0089] as amended in the last response.

It is respectfully submitted that the introduction of new matter has been carefully avoided and the amendments to claim 17 do not raise any new issues.

With reference to Hehr et al., Hehr et al. disclose a gate valve interposed in the delivery line between a spray nozzle and a source of air under pressure. The valve includes a valve body 46 provided with an axial threaded bore throughout its length. One end of the threaded bore of the valve body is connected to spray nozzle 28 having external threads and the other end of threaded bore of the valve body is connected to a externally threaded hose collar 58 connected to a flexible hose 30. Interposed between the inner end of the hose collar 58 is a resilient annular gasket 62 of rubber, a metal washer 64, and a valve slide 50.

With reference to Keizers, Keizers discloses a sandblasting method using abrasives, such as untreated sands. The abrasive and water is fed to a pressure tank so that a flowable water-abrasive mixture is produced in the pressure tank and this mixture is removed from the pressure tank and fed through a hose pipe to a blast nozzle.

With reference to Goodwin et al., Goodwin et al. disclose a nozzle for abrasive laden slurry wherein the nozzle has a plurality of sections and each section made out of different grade of material. Examples of materials listed in Goodwin et al. include diamond, ceramic materials, boron carbide and tungsten carbide.

More importantly, neither Hehr et al. Keizers, nor Goodwin et al. disclose, teach or suggest a valve having "an elongate tubular strut means bearing at a first end thereof on a first of said valve seat means", "said valve seat means being urged sealingly together by the pressure of the carrier liquid exerted on a second end of the strut means", and "the flow of abrasive particles and carrier liquid being passed to the valve seat means through said tubular strut means" as now recited in amended claim 17. One benefit of the presence of the strut means of the present invention is that its end contacting the valve seat means may move with the valve seat means as the valve is opened and closed, while its other end remains stationary. The pressure from the carrier fluid is still transmitted along the strut means to urge the valve seats together. Meanwhile, the carrier fluid and abrasive mixture is led to the valve seat means along the same tubular body. Having a dual purpose tube of this form may produce a simpler, cheaper and more reliable valve design.

With reference again to Hehr et al., once the valve in Hehr et al. is assembled, the threaded valve body 46 restricts movement of the threaded hose collar 58 relative to the valve slide 50. More importantly, there is no movable tube relative to the slide valve as now recited in amended claim 17. Nor are the features lacking in Hehr et al. disclosed, taught or suggested in either Keizers or Goodwin et al.

For the reasons above, it is respectfully submitted that amended independent claim 17 is patentable over the combination of Hehr et al., Keizers, and Goodwin et al. Dependent claims 19, 21, 24 and 29 are believed allowable for the same reasons noted above in connection with amended independent claim 17 from which they directly or ultimately depend, as well as for their own additional features.

In the Office Action, claims 17 and 22 were rejected under U.S.C. §103(a) as being allegedly unpatentable over Hehr et al. in view of Keizers and Kyoto-shi (EP 0884509 A1), and claims 26-28 were rejected under U.S.C. §103(a) as being allegedly unpatentable over Hehr et al. in view of Goodwin et al. and Shipman (U.S.

Patent No. 4,569,161). Applicant respectfully traverses these rejections for the following reasons.

As explained above, claim 17 has been amended to incorporate the subject matter of claim 18. Neither Kyoto-shi nor Shipman disclose, teach or suggest the features lacking in Hehr et al., Keizers, and Goodwin et al. as noted above. For the reasons above, amended independent claim 17 is patentable over the combination of Hehr et al., Keizers and Kyoto-shi. Dependent claim 22 is believed allowable for the same reasons noted above in connection with amended independent claim 17 from which it directly depends, as well as for its own additional features.

Also as explained above, claim 26 has been amended to incorporate the subject matter of claims 17 and 18 and placed in independent form. Neither Kyoto-shi nor Shipman disclose, teach or suggest the features lacking in Hehr et al., Keizers, and Goodwin et al. as noted above. For the reasons above, amended independent claims 26 is patentable over the combination of Hehr et al., Keizers and Kyoto-shi. Dependent claim 27 and 28 are believed allowable for the same reasons noted above in connection with amended independent claim 26 from which they directly or ultimately depend, as well as for their own additional features.

Claim 21

By this amendment claim 21 has been amended to correct a typographical error. Support for the valve seat means comprising "diamond" is found in paragraph [0034] of the specification.

Foreign Priority Claim

The Office Action noted that a certified copy of the priority document had not yet been filed. To perfect the foreign priority claim, a certified copy of the U.K. priority application will be forwarded shortly.

Official Fees

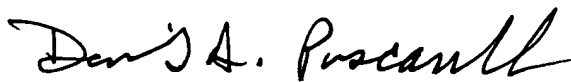
In this response, 4 dependent claims were canceled, 2 dependent claims have been placed in independent form, and a new independent claim and dependent claim have been added. Four independent claims and 13 claims total remain pending in this application. Accordingly, a check in the amount of \$100 (small entity) is enclosed herewith for the official fee associated with one additional independent claim in excess of three.

CONCLUSION

It is believed that the application is in condition for allowance, and such action is respectfully requested.

If a telephone conference would be of assistance in advancing the prosecution of the subject application, applicant's undersigned attorney invites the Examiner to telephone him at the number provided.

Respectfully submitted,



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